

scribed from immature stages were almost universally recognized. In regard to "red bugs," they have been bred twice in Europe and the adults were species of the genera *Trombidium* and *Rhyncholophus*: that the young "red bugs" attacking warm-blooded animals may come to maturity in case the host attacked is one of the small mammals, but not if one of the large mammals.

NEW AMERICAN MITES.

[Arachnoidea, Acarina.]

BY NATHAN BANKS.

The following pages contain descriptions of some new species of mites, mostly from the United States, several of which are of particular interest.

The *Histiostoma* is probably an inhabitant of the nests of rats; but these specimens were taken from a rat, while the migratorial stage was found attached to a flea. Here I refrain from quoting the famous lines of Dean Swift. Several of the species were taken by Mr. Brues from ants' nests in Texas; one, the *Hypochthonius*, is a very uncommon form. The *Halarachne*, from the seal, is the third species of this remarkable genus, and the most striking species of all of them.

The *Gamasus*, from a *Perognathus*, is another unusual form in its genus; possibly it will form a new genus or subgenus. The *Ornithodoros*, from Cuba, is the most peculiar species so far known in the genus.

Family TROMBIDIIDÆ.

Trombidium superbum, new species.

Closely similar to *T. magnificum*. Red, with several patches of white hair, one each side in front of coxæ III, extending upward, and there narrowly connected to a white spot each side over coxæ III: an elongate white patch on median part behind, and the vicinity of the anus white. Much white hair under the basal joints of legs I and II, and the tips of the joints of leg IV white; also white hair under basal joints of this leg. Sometimes there are one or two other patches of white hair. Body of general shape and size of *T. magnificum*; the hairs of body are not as long, while tarsus IV is rather longer than in that species. The palpus is like that of *T. magnificum*, but the thumb is larger.

Tucson, Arizona.

Readily separated from *T. magnificum*, as well as from the Mexican *T. dugesi*, by the patches of white hair.

Family TETRANYCHIDÆ.

Raphignathus brevis, new species.

Body yellowish red, legs rather paler. Body about one and one-half times longer than broad, surface marked with small irregular polygons; cephalothorax with four large clavate hairs each side; abdomen with five such hairs each side, two of them at posterior margin; beneath at tip is a shorter pair a little behind the anus. Legs all very short and bristly, the hind pairs not reaching behind abdomen; the anterior tarsi rather blunt at tip, the hind tarsi tapering; the bristles on the basal joints of the front legs are stouter and more spine-like than the other bristles. The palpus ends in a stout curved claw, as large as the claws of the tarsi.

Length, 0.35 mm.

From Falls Church, Virginia, in moss.

Family GAMASIDÆ.

Halarachne attenuata, new species.

Pale whitish in color, dorsal shield, legs, and sternum yellowish. Body slender, anterior half about two and a half times as long as broad, then narrowed to a slender tail, which is rather longer than body and slightly clavate at the tip. Above, on the dorsum, is an elongate basal shield, with a small, constricted anterior part and a truncate, notched tip. The stigmal aperture with the peritreme is just behind coxa III and visible from above. The sternum is small and narrow, emarginate in front, and with a pointed tip, which extends only opposite to coxæ IV. Legs I and IV are subequal in size, the joints short, except the tarsi, which are rather slender; legs II and III much stouter than others, but nearly as long, the tarsi stout and with heavier claws.

Length, 4 mm.

Taken from a seal pup at St. Paul Island, by Mr. J. Judge, October 7, 1909. Differs at once from other species in the slender "tailed" abdomen.

Gamasus frontalis, new species.

Pale yellowish, a reddish, corneous stripe on each anterior side meeting in front. Body subtriangular, broadly rounded behind, somewhat constricted in front, over one and a half times as long as broad; on each anterior edge from above coxa II to the middle of front is a narrow, corneous strip, of reddish or yellowish color, very prominent. The dorsal shield is entire and occupies about three-fourths of the surface. The dorsal surface has many curved bristles in rows, on the middle of anterior margin is a pair of straight bristles close together, and each side of them is a curved bristle; also a pair of curved bristles where the two

corneous strips unite. Legs short, I not as long as width of body, with a weak caroncle at tip; leg II enlarged, armed as in the figure, four processes from femur, two on basal part, and two near tip, one near tip of tibia, and the tarsus with two stout subterminal spines; legs III and IV simple, quite long, with many almost spine-like bristles: the caroncle of leg IV about one-half as long as tarsus IV. On the venter is seen a broad sternal plate, with a bristle in each corner and at middle of sides; other plates indistinct, but bristles at bases of coxæ and others on venter, and a fine hair each side of anus. The spiracle has a long peritreme reaching nearly to front of body.

Length, 1.3 mm.

Many specimens from Los Palmos, 3,500 feet, Santa Rosa Mountains, California, May 27, taken by Mr. F. Grinnell, from *Perognathus*. The mites use their enlarged second pair of legs to hold the hair of the host.

Gamasus calcarator, new species.

Body of male once and a half longer than broad, with a broad hood in front covering mouthparts; dorsal shield divided in the middle, on sides, and behind with many long, fine hairs. Leg I very slender; leg II heavy, the femur rounded above and on outer side very prominent, below with a long, curved, toothed process, next joint also with process below, tarsus like a large claw; hind legs slender, hairy, a spine above on femur, and two below near middle of tibiæ, and two on outer side of metatarsi. Female narrowed in front, but the mouthparts visible. There is a large, broad ventral plate, including the anus and reaching forward to coxæ IV. The color is pale yellowish, leg I paler than the others.

Taken from nest of field mouse at Falls Church, Virginia, in November.

Gamasus partitus, new species.

Pale yellowish. Body nearly twice as long as broad, broadest behind the middle, in front with a shoulder-like part, the dorsal shield nearly divided beyond the middle, the posterior part truncate behind; a pair of large bristles in middle near the front margin, a still larger humeral bristle and one each side on posterior part of the anterior shield; posterior shield with a number of small, fine hairs, mostly in rows, and some hairs beyond the shield, a small clavate hair each side near outer hind corner of shield. Legs very long and bristly, a bristle at tip of hind tibia is twice the length of that joint, a few stouter spines, one near middle of the hind tarsus below. A few hairs each side on the sternal plate, and some behind near tip of the body.

Length, 0.8 mm.

Falls Church, Virginia.

Gamasus predator, new species.

Male.—Pale yellowish. Body elongate pyriform, nearly twice as long as broad, dorsal shield entire, nearly covering body, leaving only a narrow hind border; shield with many fine, rather short hairs; epistome rather large, with three equal apical teeth, and a smaller one each side. Legs long and slender, hairy, tarsus I as long as tibia, tarsus IV nearly twice as long as tibia; leg II greatly enlarged and armed with projections as in the figure.

Length, 1 mm.

Falls Church, Virginia.

Macrocheles helvina, new species.

Color pale yellowish. Body not twice as long as broad, narrowed near front, and constricted over coxæ II, broadest much behind the middle, dorsum with many very prominent clavate scale-like hairs, a rather more prominent one at each humerus, and a pair in front near middle. Venter without prominent hairs or bristles; legs not very long, clothed with clavate hairs and short spines; tarsus I plainly longer than the tibia, tarsus IV nearly twice as long as tibia; leg II heavier than the other pairs, but not armed.

Length, 0.8 mm.

Falls Church, Virginia.

Differs from *M. mustus* in having many clavate hairs on cephalic part of dorsum.

Laelaps longitarsus, new species.

Shield dark yellow, hind margin of body white, legs pale yellowish. Shield covering most of the dorsum, pointed behind, covered with many short, fine hairs, and in front with two stouter bristles each side; margin of dorsum with many fine, long hairs. Legs slender, the tarsi long, especially the hind tarsus; all joints hairy. Ventral shield narrow in front between the coxæ, broad and broadly rounded behind; anal shield broader in front than behind.

Length, 1 mm.

Taken from a mole's nest at Falls Church, Virginia, in December.

Pteroptus echinipes, new species.

Body once and three-fourths as long as broad, broadest between legs II and III but not angled. Dorsum without hairs, except a pair of small ones in front, one at each humerus, and two longer ones close together each side near the tip. Legs very heavy and with long, stiff bristles, those on the basal joints much longer than the joints and extending backward over the body. Body of female much broader behind.

Length, 1 mm.

From *Myotis lucifugus*, at Homer, New York.

***Pteroptus grossus*, new species.**

Body broadest at anterior third, rounded in front, tapering behind to a small rounded tip; above without bristles on anterior part, except a few along the margin and one on each humerus; apical third of dorsum with many short, stiff bristles, becoming larger near the tip, where they are very numerous. Legs large and heavy, with many large bristles, longer than the joints, except on the tarsi. Venter without bristles, and only a few small ones on the ventral side of the legs. In the female the posterior part of abdomen is broader, and the shield does not reach behind the hind coxæ.

Length, 1.4 mm.

From Beulah, New Mexico, on a bat.

Family IXODIDÆ.***Ornithodoros marginatus*, new species.**

Body fully twice as long as broad, much narrowed and tapering in front to a pointed cone, which greatly overhangs the mouthparts; behind the body is broadly rounded. The dorsum is concave, the margin elevated all around and with a row of small tubercles, each tipped by a brush of short, erect hair, extremely characteristic. The dorsum is slightly elevated in the middle, with irregular depressions each side; the surface with scattered small tubercles, each tipped with a tuft of short hair; pleura with similar tubercles, but none as large as those on the margin of body. Sternum without tubercles, but with simple hairs. Legs rather short and stout, leg I about one-half the length of body, all joints with many simple hairs, those on the upper surfaces of the last and penultimate joints of legs I, II, III short and erect; all tarsi without humps; the penultimate joint largest near the tip. No eyes. The beak prominent from below, the palpi slender; no flaps at sides, all with stiff, simple hairs. The anus large, situate considerably behind the hind coxæ; a transverse furrow behind it. The sternum with a groove each side in front, approximating near coxæ III; a groove each side on posterior part of sternum, bending outward behind the hind coxæ.

Length, 5 to 8 mm.

From a cave in Guanajay Mountains, Cuba, May 5 (Palmer and Riley); also from a West Indian bat (Barrett) probably from Porto Rico. The cave specimens are mostly covered with dirt; they doubtless fed on the bats in the cave. Readily known from all other species by the row of tufted humps on margins of body.

***Ixodes æqualis*, new species.**

Shield yellow-brown to dark red-brown. Capitulum subtriangular, porose areas rather large, subcircular, less than one-half a diameter

apart. Shield nearly diamond-shaped, the anterior and posterior sides subequal; surface evenly and rather heavily punctured; the lateral carinae distinct. Stigmal plate circular. Legs of moderate length; tarsus I only a trifle longer than the preceding joint; all tarsi abruptly narrowed near tip. Coxa I with a distinct but short spine at base and a minute tooth near tip; a smaller apical tooth on coxae II and III. No projection on the lower side of rostrum. Surface of body very finely haired.

Length of shield (female), 1 mm.

From Berkeley Hills, California, taken from the California ground squirrel, *Otospermophilus beecheyi*, by Drs. Wellman and Wherry.

It runs to *I. angustus* in my table of *Ixodes* (Revision of the Ixodoidea), but differs at once in shorter shield, of different shape, more circular porose areas, shorter tarsus I, etc.

Family ORIBATIDÆ.

Pelops tibialis, new species.

Color red-brown, legs pale. Cephalothorax small, pointed in front; a rather broad lamella each side, with slender, pointed tip, lying close to side of head, and outside of this is another lamella, not reaching so far forward, also with pointed tip, and a heavy, finely serrate bristle arising from beneath its tip; pseudostigmatic organ short, capitate; superior bristle a large, spatulate, scabrous scale reaching in front of the cephalothorax. Abdomen narrowed in front, broad and broadly rounded behind, surface roughened, behind with about seven clavate or scale-like hairs each side; wings not very long, but large and deep, with anterior edge nearly straight, and lower edge evenly rounded. Venter nearly smooth, genital aperture one and a half times its length in front of the equal anal aperture; coxal plate with three lines each side, the posterior one the shortest; a sharp-pointed tectopedium in front of coxa I and one behind. Legs slender, the patella more slender than other joints, especially in legs I and II, while the tibiae and tarsi are rather enlarged, and besides the simple hairs have a few stout spines; femora III and IV are very broad; claws three, the middle one very much larger than the others; patellae and tibiae I and II each with a large serrate spine on each side, that on the outer side the heavier.

Length, 0.7 mm.

From Falls Church, Virginia.

Galumna partita, new species.

Yellowish brown, a paler spot at base of abdomen. Cephalothorax small, a broad hyaline lamella each side reaching to tip and extending out in a sharp point; superior bristles short and straight, arising from a

transverse ridge; pseudostigmatic organ large, spatulate, semi-erect, and projecting forward. Abdomen globose, without hairs, wings large and deep, projecting forward, but not very long. Venter with the genital aperture scarcely its length in front of the barely larger anal opening; the genital broader than long and the anal also, but broadest behind. Coxal plate with two short lines each side, hind margin of coxa IV not distinct. Legs short, with simple hairs; three unequal claws.

Length, 0.3 mm.

Falls Church, Virginia.

The large pseudostigmatic organ reminds one of *G. armipes*, but it is otherwise quite different.

Galumna pterota, new species.

Pale yellowish. Elongate; cephalothorax rather large and long, no trace of lamella on side, superior and inferior bristles distinct and quite long; pseudostigmatic long and capitate. Abdomen smooth, without hairs. Wings very large, elongate, evenly rounded beneath. Venter smooth, genital aperture nearly twice its length in front of the much larger anal aperture, the latter with an angulate mark in front of it; sternal plate with three short lines each side, the middle one the longest, no posterior edge. Legs rather slender; no thickened hairs, tarsi very hairy, the penultimate joint rather swollen above near tip; hind tibiae slightly curved above.

Length, 0.4 mm.

Falls Church, Virginia, under chips in woods, August 11.

Oribatella valida, new species.

Color dark red-brown, a prominent yellow spot at base of abdomen. Cephalothorax with a broad lamella each side, truncate and close together at tip, the outer tip sharp-pointed and down-curved, but without an apical bristle, inner with a very stout, thickened bristle; superior bristles also heavy, arising from near the middle of cephalothorax; pseudostigmatic organ long, clavate near the tip. Abdomen rather elongate, narrowed behind, without hairs; wings large, inrolled, evenly rounded below; a distinct tectopedium behind coxa I; genital aperture fully once and a half its length in front of the much larger anal aperture, the latter broader than long; coxal plate with three lines each side, the posterior one much shorter than the others. Legs rather slender, with long, fine hairs; patella II with a very stout spine on the outer side near tip, as long as the joint; claws three, unequal.

Length, 0.5 mm.

Great Falls, Virginia.

Related to *O. signata*, but the pseudostigmatic organ is longer, and there is no bristle at the outer tip of lamella.

Oribatella angusta, new species.

Dark red-brown. Body rather elongate, nearly twice as long as broad. The cephalothorax with broad lamella each side reaching over the tip of the head, emarginate at tip, and with a moderately long bristle. Pseudostigmatic organ of moderate length, clavate at tip. Front of dorsum of abdomen extending out on cephalothorax; wings rather long, not very deep, margins entire, a fine bristle at shoulder and one above, three each side near tip. Sternum with three lines each side, the middle one the longest. The genital opening touching coxæ IV, small, sub-circular, twice its length in front of the much larger anal opening, the latter as broad behind as long, but narrowed in front. Legs short, with mostly simple hairs, some thickened serrate ones on the last and penultimate joints of legs I and II; hind legs very slender; claws three, unequal.

Length, 0.7 mm.

From nest of *Eciton cacum*, at Austin, Texas (Brues).

Eremæus modestus, new species.

Dark red-brown; legs paler. Cephalothorax with four very long bristles; pseudostigmatic organ very short and capitate. Abdomen slightly elongate, with a row of four submedian bristles each side and a marginal row of five, and two on each shoulder, shorter than those of the submedian rows. Venter smooth, genital aperture reaching forward to hind margin of coxæ II, circular, fully two and one-fourth times its diameter in front of the larger anal opening. Sternum divided by line in front, with a line each side; hind coxæ with a faint line reaching up in front of the genital aperture. Front legs rather short, hind pairs much longer, tarsi very hairy; three equal claws.

Length, 0.65 mm.

Whittier, California, on orange (Mr. Quayle).

Liacarus capitatus, new species.

Yellow brown, a pale yellow spot at base of abdomen. A lamella each side on the cephalothorax, and at tip a trans-lamella; superior and inferior bristles stout, straight, and finely serrate, equal in length, and about as long as the side lamella. Pseudostigmatic organ short, capitate. Abdomen about one and a half times as long as broad, tapering each way; above each side with two rows of stout, finely serrate bristles, three in inner row, five in outer row, one on humerus, a marginal row, and rather shorter ones at tip, about thirty-four in all. Legs slender, the basal joints with curved, finely serrate bristles, and the tarsi rather shorter than the tibiae; three unequal claws. Venter smooth; the genital opening a little longer than broad, fully one and two-thirds times its length in front of larger anal aperture, the latter nearly circular. The

genital opening is only a little behind the suture behind coxæ II; in front of this suture is a line each side, and behind it is a shorter one; the line to the hind coxæ not distinct.

Length, 0.4 mm.

Many specimens sent by Prof. C. E. Sanborn from Stillwater, Oklahoma.

Liacarus medialis, new species.

Brown; legs paler, and a pale spot at base of abdomen and also on middle area of the cephalothorax. Cephalothorax very small, subtriangular, a lamella each side, meeting at tip, and a narrower outer lamella which at tip has a fine hair; superior bristles long, suberect, pseudostigmatic organ rather long, enlarged at the middle. Abdomen elongate, narrowed behind, shoulders weakly margined: two simple, humeral bristles and one behind them; on each posterior side margin are four long, simple hairs, and above is a row of three each side. Three complete lines on coxal plate, hind coxæ distinctly outlined behind, indented by the genital aperture, which is broader than long and fully two and one-half times its length in front of the very much larger anal opening the latter twice as long as the genital and a little longer than broad. Legs slender, mostly with simple hairs, a stouter spine-like one from patellæ I and II; femur II broad and angled near tip, three unequal claws.

Length, 0.8 mm.

Falls Church, Virginia.

Oribata consimilis, new species.

In general appearance very similar to *O. (Belba) minuta* Bks., but easily known therefrom by the short pseudostigmatic organ, very strongly clavate at tip; in *O. minuta* it is nearly twice as long and only feebly clavate at tip. The cephalothorax has three fine, simple hairs each side; the abdomen has two rows each side, each row of four or five long, curved simple bristles; rather larger than in *O. minuta*; there are six or eight much smaller ones rather closer together near the tip of the body. The legs are rather longer than in *O. minuta*, and are provided with long, simple hairs; the hind tarsi are plainly longer than tibia plus patella (in *O. minuta* barely longer). The genital aperture is about once and a half its length in front of the much larger anal opening.

Length, 0.5 mm.

From Great Falls, Virginia.

Nothrus terminalis, new species.

Pale yellowish-brown throughout. Cephalothorax constricted over coxæ I, tip truncate, with two very small curved bristles; pseudostigmatic organ a long, simple bristle; near its base is a scale-like hair. Abdomen fully twice as long as broad, rather broader behind than at mid-

dle, tip broadly rounded; dorsum with a median, oblong, shallow depression, no hairs apparent above; at tip are four clavate hairs and over the base of each outer one is a smaller, inconspicuous one. Legs very stout, especially the basal joints, roughened, all, except tarsal joints, with a long, appressed, clavate, scale-like hair on each side; tarsi with some simple hairs; patellæ and tibiæ III and IV with an irregular swelling below; but one claw. Coxæ all distinct; venter with the genital and anal apertures approximate, the former the larger, much as in *N. anauniensis* C. and F.

Length, 0.7 mm.

From Austin, Texas; in nest of *Eciton cæcum* (Brues).

Nothrus carinatus, new species.

Reddish yellow, legs paler. Cephalothorax narrowed near middle, but blunt in front, with a pair of stiff, curved bristles near tip, a ridge each side extending out to the pseudostigma; the pseudostigmatic organ is a moderately long bristle, finely serrate, but not clavate. Abdomen about one and one-half times as long as broad, broadest behind the middle, on the posterior side with four curved bristles each side, none clavate; a short clavate humeral bristle, and a submedian row of four simple hairs; two ridges each side on the dorsum; one is sub-median just within the sub-median row of hairs, the other is sub-lateral, and curved outward toward tip. Venter with the genital and anal apertures connate, the latter nearly twice as long as the former; coxæ all distinct, that of I and II broad at base, III and IV pointed at base. Legs short, all joints (except tarsi) with curved thickened bristles, but none clavate; tarsi with many long, fine, simple hairs; one large claw.

Length, 0.7 mm.

From Great Falls, Virginia, under moss.

Hypochthonius texanus, new species.

Body about twice as long as broad, the sides of abdomen nearly parallel. Cephalothorax scarcely one-half as long as abdomen; it shows some grooves above and each side five fan-like hairs, one in front, one on middle of lateral margin, one near posterior corner, one in front above the margin, and one near the pseudostigmatic organ; the latter is a simple bristle, not very long. The abdomen above shows four transverse furrows, two rows each side of four fan-like hairs, one marginal, and the other submarginal and six similar hairs around the posterior margin. The genital aperture is square; the anal is one and one-half times as long as broad, as wide as the genital opening, and close to it; each flap, or door, has four scale-like hairs upon it, the last the broadest, and each side of the anus are two broad scales. The sternal region is very broad, so that the legs are widely separate, III pair at corners of a very broad plate, IV pair rather closer together than III pair, and from a plate longer in the middle. All legs short, and with scale-like hairs

from basal joints; femora III and IV each with three narrow scales beneath.

Length, 0.4 mm.

Austin, Texas, in nest of *Eciton cecum* (Brues).

Family TYROGLYPHIDÆ.

Histiostoma tarsalis, new species.

Body about one and one-half times as long as broad, broadly rounded behind, slightly tapering in front to the beak; dorsal surface smooth, with a few very short bristles. Legs as long as body, front pairs thicker than hind pairs. All tarsi very long, as long as the three preceding joints taken together, extreme base of tarsi I and II show the sense-hair and near it is a short, stout spine, other spines at middle and tip of tarsi (as figured), the penultimate joint (tibia) of legs I and II has a long bristle above beyond middle, the femora I, II, and IV have a short spine beneath at middle, also under tibia III and IV at middle.

Length, 0.35 mm.

Taken on *Mus rattus* by Dr. M. B. Mitzmain; a *Hypopus* (probably of the same species) attached to a rat flea, *Ceratophyllus fasciatus*; all from Berkeley, California. This *Hypopus* has been figured in Entomological News, 1909, p. 216, by Dr. Fox.

EXPLANATION OF PLATES I TO III.

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| FIG. 1. <i>Gamasus frontalis</i> , leg II tarsus. | FIG. 15. <i>Histiostoma tarsalis</i> , details. |
| 2. <i>Oribata consimilis</i> , pseudostigma. | 16. <i>Macrocheles helvina</i> . |
| 3. <i>Oribatella angusta</i> . | 17. <i>Nothrus carinatus</i> . |
| 4. <i>Pteroptus echinipes</i> . | 18. <i>Gamasus predator</i> , leg II. |
| 5. <i>Raphignathus brevis</i> . | 19. <i>Galumna partita</i> . |
| 6. <i>Ornithodoros marginatus</i> , margin of body. | 20. <i>Galumna pterota</i> . |
| 7. <i>Liacarus medialis</i> . | 21. <i>Liacarus capitatus</i> . |
| 8. <i>Nothrus terminalis</i> , end of body, pseudostigma. | 22. <i>Gamasus calcarator</i> , leg II. |
| 9. <i>Ornithodoros marginatus</i> , legs I and IV. | 23. <i>Ixodes equalis</i> , shield capitulum. |
| 10. <i>Oribatella valida</i> . | 24. <i>Laelaps longitarsus</i> . |
| 11. <i>Hypochthonius texanus</i> . | 25. <i>Eremæus modestus</i> . |
| 12. <i>Halarachne attenuata</i> , sternum. | 26. <i>Gamasus calcarator</i> , epistome. |
| 13. <i>Pelops tibialis</i> , details. | 27. <i>Eremæus modestus</i> , leg III. |
| 14. <i>Pteroptus grossus</i> . | 28. <i>Gamasus calcarator</i> . |
| | 29. <i>Gamasus partitus</i> . |
| | 30. <i>Laelaps longitarsus</i> . |